FURTHER OBSERVATIONS ON THE BACTERIOLOGY OF RHINITIS WITH SPECIAL REFERENCE TO AN ANAEROBIC ORGANISM (BACILLUS RHINITIS) *

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In a previous article[1] I described a delicate, curved, gram negative, anaerobic organism, which was observed in the early stages of acute rhinitis, before the discharge became purulent. Altho this organism resembled a spirochete in some respects, it is probably a bacillus. I would suggest naming it Bacillus rhinitis.

This bacillus was observed in smears in thirty cases of acute coryza, in three cases of chronic coryza, and in one case of chronic pharyngitis. It was seen only once in twenty normal noses. The organism was isolated in pure culture eight times. It produced a rhinitis in the human subject and in a dog. Changes occurred in the opsonic index to this organism, the index being low during the acute stage and rising as the infection subsided.

On account of the frequency with which this bacillus was observed in this series of cases, it was thought it might be of interest to determine its prevalence in a larger number of cases and during different seasons of the year. Smears from the nose were made and stained with carbol-gentian-violet. The bacilli were present in five of sixty-three smears made from the normal nose. Forty-seven percent of these smears contained no bacteria. Smears from the nose in fifty cases of acute coryza while the discharge was mucoid in character, showed the bacillus rhinitis in all but one. In 66 percent of these smears this organism was the only one observed. It was not seen in sixteen cases of purulent rhinitis, in scarlet fever, and diphtheria. It was present in seventeen of the eighteen cases of chronic rhinitis in which the discharge was not purulent. It was not seen in seven chronic cases with purulent secretion. The combination of these results with my previous observations shows that the bacilli were present in 6 percent of normal noses, 98 percent of the cases of acute rhinitis, and 90 percent of the chronic cases with mucoid discharges.

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1. Jour. of Infect. Dis., 1913, 13, p. 283.

All of the smears from the nose were carefully examined for fusiform bacilli on account of the resemblance at times between the two organisms in cultures. The bacillus fusiformis was not observed in any of the acute cases, and only three times in cases of chronic purulent rhinitis. The two organisms are readily distinguished in smears, as seen in the specimen from the pharynx, in pharyngitis, where the two may be seen side by side. The bacillus rhinitis does not stain so distinctly as the fusiform bacillus; it is also more curved and is not fusiform. They can be distinguished also in mixed cultures from the throat, where the bacillus fusiformis is always present. The bacillus rhinitis is flexible and has a slightly progressive motion which is different from the vibratory motion of the bacillus fusiformis.

The opsonic index in patients immunized with Bacillus rhinitis was found to be high to seven strains of this organism, but normal to two strains of the bacillus fusiformis isolated from cases of Vincent's angina. The same results were obtained with the serum of a patient recovering from an acute rhinitis. Complement-fixation experiments made by Howell,[2] showed with the serum of one acute case of rhinitis a strong fixation with the bacillus rhinitis, but no fixation with the bacillus fusiformis. Another case examined at the end of a long attack of rhinitis, in which smears and cultures were not made, showed strongly positive reaction to both. The sera of three patients immunized with the bacillus rhinitis showed positive fixation with the three strains of the bacillus rhinitis and no fixation with the bacillus fusiformis. A patient with Vincent's angina gave a positive fixation with the bacillus fusiformis and no fixation with the bacillus rhinitis.

On account of the difficulty of always distinguishing between the bacillus rhinitis and cilia, anaerobic cultures were made in twenty-six cases. The external nares being first washed with 95 percent alcohol, the secretion was collected on sterile gauze, on a swab, or in a Petri dish. The discharge was collected from the nasopharynx in some of the chronic cases and washed three times in sterile salt solution. Cultures were made on goat blood agar, the agar being slightly alkaline in reaction, and in ascites broth (1:3), the broth being made from Fairchild's culture peptone. Sterile tissue was at times added to the media, but did not appear to add to its efficacy. Ascites fluid was used with the goat blood in some of the blood agar slants. It was often difficult to grow and to isolate this bacillus in pure culture. It was

2. Jour. Infect. Dis., 1915, 16, p. 456.

grown in seventeen of the twenty-one acute cases and isolated in pure culture nine times. The organism was isolated in pure culture from the sputum in two of these cases with accompanying bronchitis. Pure cultures were obtained from all of the five chronic cases, in which the organisms were present in large numbers. The organism has not been grown in cultures from the normal nose.

Aerobic cultures, on goat blood agar, with and without ascites fluid, were also made to obtain some idea as to the number and kinds of other bacteria present. A colony or two of the staphylococcus albus appeared in almost every case. There were a few colonies of diphtheroid bacilli in five cases. The streptococcus pyogenes was isolated once. The streptococcus viridans grew twice and the bacillus mucosus three times in the anaerobic broth cultures. In a few cases in which aerobic bacterial antigens gave positive fixation, the corresponding bacteria were not found in the smears or culture. On the other hand, according to Howell's observations, complement fixation was generally obtained with the sera of persons with acute rhinitis when the bacillus rhinitis was employed as the antigen.

The results of human immunization experiments with vaccines of the bacillus rhinitis will be reported later.

CONCLUSION

The bacillus rhinitis appears then to have some etiologic relation to acute and chronic rhinitis on account of its almost constant presence in the nose in such cases, its general absence from the normal nose, its ability to produce rhinitis experimentally with recovery in pure culture, and on account of the production, in cases of acute and chronic rhinitis and in persons injected with the bacillus, of specific antibodies (opsonins and complement-binding bodies).